

**A**

FIGURE 1.

## FIGURE 2.

## Human DBI DNA and Protein Sequences:

```

      10      20      30      40      50      60
AGCGGGGGGAGTGGGGAGGAGGGGGGTCGGCCGCCGAGCCATGGAGGCCAACTGGACCG
                                     M E A N W T>

      70      80      90     100     110     120
CGTTCCTGTTCCAGGCCCATGAAGCTTCCCATCACCAACAGCAGGCAGCACAGAACAGCT
A F L F Q A H E A S H H Q Q Q A A Q N S>

     130     140     150     160     170     180
TGCTGCCCCCTCCTGAGCTCTGCCGTGGAGCCCCCTGATCAGAAACCATTGCTTCCAATAC
L L P L L S S A V E P P D Q K P L L P I>

     190     200     210     220     230     240
CAATAACTCAGAAACCTCAGGGTGCACCAGAAACATTAAAGGATGCCATTGGGATTAAAA
P I T Q K P Q G A P E T L K D A I G I K>

     250     260     270     280     290     300
AAGAAAAACCCAAAACCTTCATTTGTGTGCACTTACTGCAGTAAAGCTTTCAGGGACAGCT
K E K P K T S F V C T Y C S K A F R D S>

     310     320     330     340     350     360
ATCACCTGAGGCGCCACGAATCCTGCCACACAGGGATCAAGTTGGTGTCCCGGCCAAAGA
Y H L R R H E S C H T G I K L V S R P K>

     370     380     390     400     410     420
AAACCCCCACACGGTGGTTCCCTTATCTCTACCATCGCTGGGGACAGCAGCCGAACCTT
K T P T T V V P L I S T I A G D S S R T>

     430     440     450     460     470     480
CGTTGGTCTCGACCATTGCAGGCATCTTGTCAACAGTCACTACATCTTCCTCGGGCACCA
S L V S T I A G I L S T V T T S S S G T>

     490     500     510     520     530     540
ACCCCAGTAGCAGTGCCAGCACCACAGCTATGCCAGTGACCCAGTCTGTCAAGAAACCCA
N P S S S A S T T A M P V T Q S V K K P>

     550     560     570     580     590     600
GTAAGCCTGTCAAGAAGAACCATGCTTGTGAGATGTGTGGGAAGGCCTTCCGAGATGTGT
S K P V K K N H A C E M C G K A F R D V>

     610     620     630     640     650     660
ACCATCTCAATCGACACAAGCTCTCCCATTCAGATGAGAAACCCTTTGAGTGTCTTATTT
Y H L N R H K L S H S D E K P F E C P I>

     670     680     690     700     710     720
GTAATCAGCGCTTCAAGAGGAAGGACCGGATGACTTACCATGTGAGGTCTCATGAAGGAG
C N Q R F K R K D R M T Y H V R S H E G>

     730     740     750     760     770     780
GCATCACCAAACCCTATACTTGCAGTGTGTTGTGGGAAAGGCTTCTCAAGGCCTGACCACT
G I T K P Y T C S V C G K G F S R P D H>

```

## FIGURE 2 (CONT)

790 800 810 820 830 840  
 TAAGCTGTCATGTAAACATGTCCATTCAACAGAAAGACCCTTCAAATGCCAAACGTGCA  
 L S C H V K H V H S T E R P F K C Q T C>

850 860 870 880 890 900  
 CTGCTGCCTTTGCCACCAAAGACAGACTGCGGACACACATGGTGCGCCATGAAGGCAAGG  
 T A A F A T K D R L R T H M V R H E G K>

910 920 930 940 950 960  
 TATCATGTAACATCTGTGGGAAGCTCCTGAGTGCAGCATAACATCACCAGCCACTTAAAGA  
 V S C N I C G K L L S A A Y I T S H L K>

970 980 990 1000 1010 1020  
 CTCATGGGCAGAGCCAAAGTATCAACTGTAATACATGTAAACAAGGCATCAGTAAACAT  
 T H G Q S Q S I N C N T C K Q G I S K T>

1030 1040 1050 1060 1070 1080  
 GCATGAGTGAAGAGACCAGTAACCAAAAGCAGCAGCAGCAGCAGCAGCAACAACAAC  
 C M S E E T S N Q K Q Q Q Q Q Q Q Q Q Q>

1090 1100 1110 1120 1130 1140  
 AACACAACATGTGACAAGCTGGCCAGGGAAGCAAGTAGAAACACTCAGACTGTGGGAAG  
 Q Q Q H V T S W P G K Q V E T L R L W E>

1150 1160 1170 1180 1190 1200  
 AAGCTGTTAAAGCAAGGAAGAAAGAAGCTGCTAACCTGTGCCAAACCTCCACGGCTGCTA  
 E A V K A R K K E A A N L C Q T S T A A>

1210 1220 1230 1240 1250 1260  
 CGACACCTGTGACTCTCACTACTCCATTTCAGTATAACATCCTCTGTGTCGTCTGAGACTA  
 T T P V T L T T P F S I T S S V S S E T>

1270 1280 1290 1300 1310 1320  
 TGTCAAACCCAGTCACAGTGGCAGCTGCAATGAGCATGAGAAGTCCAGTAAATGTTTCAA  
 M S N P V T V A A A M S M R S P V N V S>

1330 1340 1350 1360 1370 1380  
 GTGCAGTTAACATAACCAGCCCAATGAACATAGGGCATCCTGTAACCTATAACCAGTCCAT  
 S A V N I T S P M N I G H P V T I T S P>

1390 1400 1410 1420 1430 1440  
 TATCCATGACCTCTCCTTTAACTACTACTACCCAGTCAACCTCCCCACCCCGTCACTG  
 L S M T S P L T L T T P V N L P T P V T>

1450 1460 1470 1480 1490 1500  
 CCCCAGTGAATATAGCACACCCTGTCCACCATCACATCTCCAATGAATCTACCCACACCTA  
 A P V N I A H P V T I T S P M N L P T P>

1510 1520 1530 1540 1550 1560  
 TGACATTAGCCGCCCTCTCAATATAGCAATGAGACCTGTAGAGAGCATGCCTTTCTTGC  
 M T L A A P L N I A M R P V E S M P F L>

## FIGURE 2 (cont)

1570 1580 1590 1600 1610 1620  
CCCAAGCTTTGCCTACATCACCGCCTTGGTAAACAGTATTATAAAATCAAAATATGGGTA  
P Q A L P T S P P W \*>

1630 1640 1650 1660 1670 1680  
AAAGTAAATATTTACCAGCAACTTAACTTTTAGTTGATTAAAGCAAAAAGTAAACCATGA

1690 1700 1710 1720 1730 1740  
AATTGGGAGATTTTATTACATTAGTTAATAAGAGTGTGGTAGCATTTTCTCCAATTTGG

1750 1760 1770 1780 1790 1800  
CTGGGATTATTCAAAGTAGGGTGTGTATGTAACCTTATCACTGGACCACTTTAGTTTAAATC

1810 1820 1830 1840 1850 1860  
AGAAATTCCTTTTAGCTGACAACATTGCTTAAACAGGATAGTAGTTGGCAAGATGAAATG

1870 1880 1890 1900 1910 1920  
CCAGAATTAAACCAATCATAAGTAGAACCCACTTCAAAATAAAAAACAGCATTACTAT

1930 1940 1950 1960 1970 1980  
TTCTAATCCCAAGGAATCACTTTATTGTAAACACTAGCAGAACTCTTCTCCCTATACAAG

1990 2000 2010 2020 2030 2040  
GTGGATGGCTGATTTTAAACCTGAAATTTTAAATCCACAGATTGAGAGCTAGTGTAGAATT

2050 2060 2070 2080 2090 2100  
GTCTGTGTTTATTGTTTTTATGAGTAAATACATGCATTGTCATAATAAAATGCATTTTCAG

2110 2120 2130 2140 2150 2160  
AGAATATGCATTTTACCTTTGGGAATATGTTAATTTTCAGGCAGCATTCCTATGGGAAAG

2170 2180 2190 2200 2210 2220  
GTGATACCAGCTCTGATATGCAAAGCATATGATAATTTATCATTCTAACTTCAACGTATA

2230 2240 2250 2260 2270 2280  
ATAGGGATTGTGACCTGATATTTGGAGATGTAAATATTGCTCAGCATATTAATCCCGATG

2290 2300  
GAATATAGCATTGTAGTTGACTTTTT

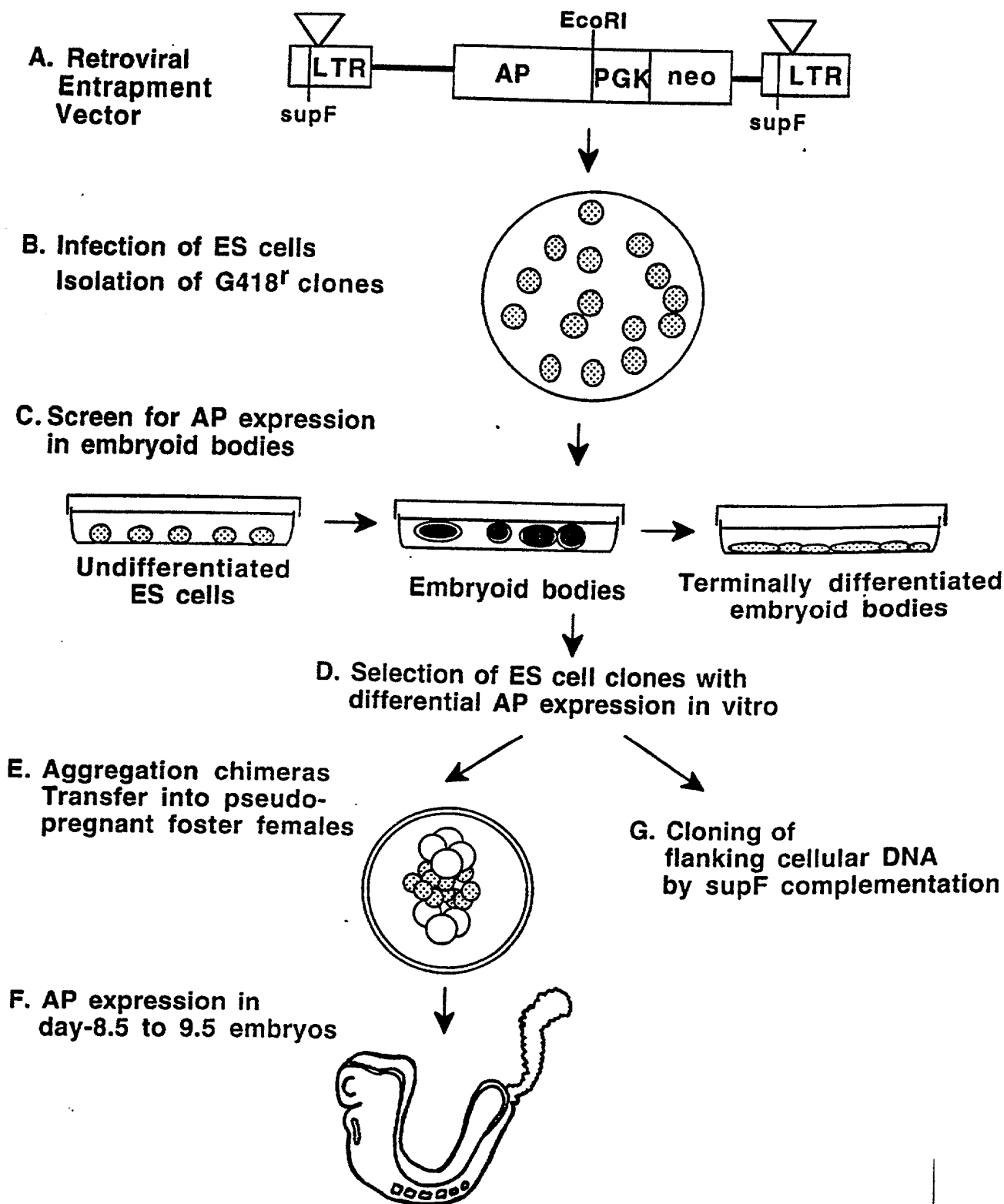


FIGURE 3.

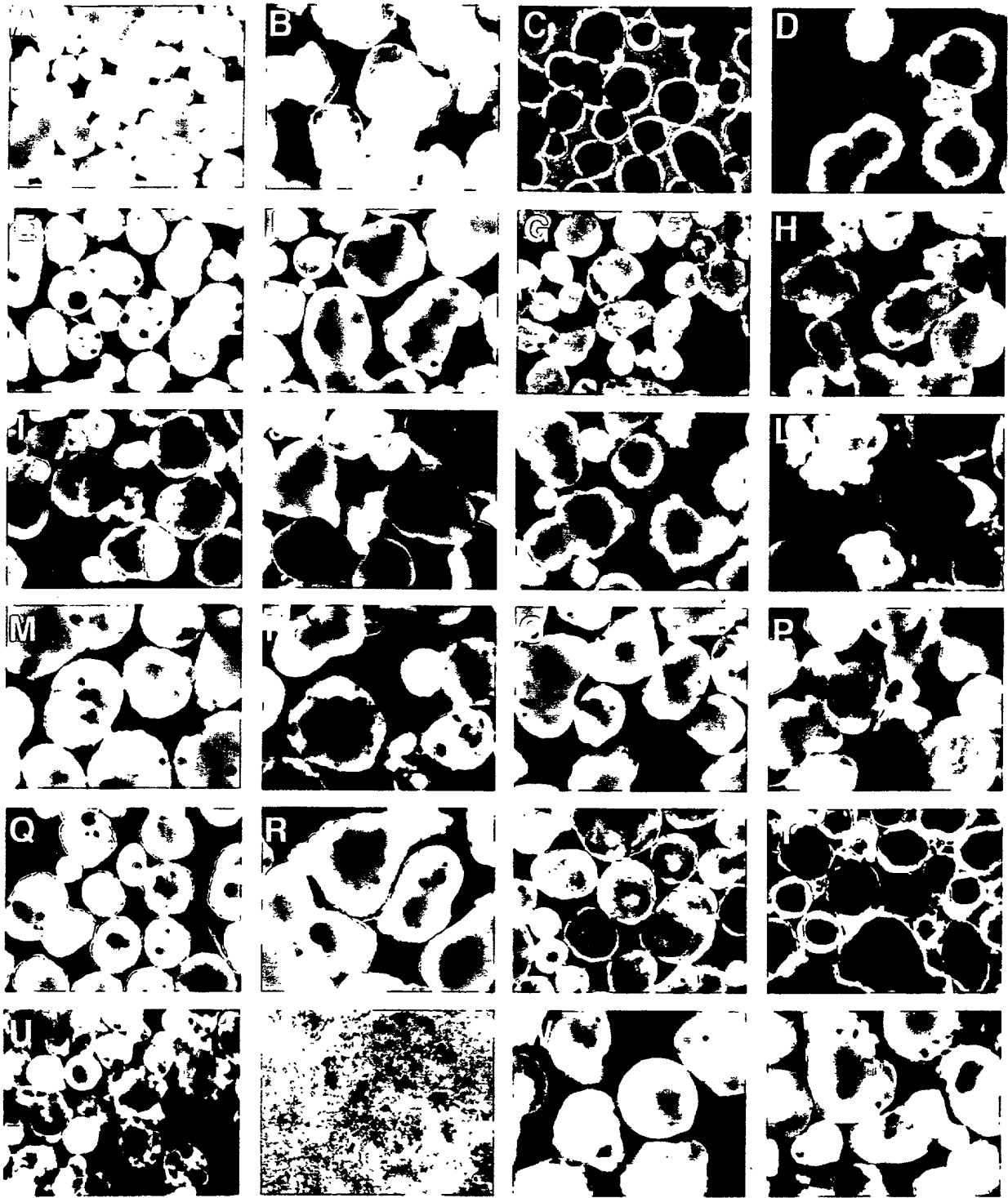


FIGURE 4.

21200 (sheet 7 of 20)

202710 FEB 500T

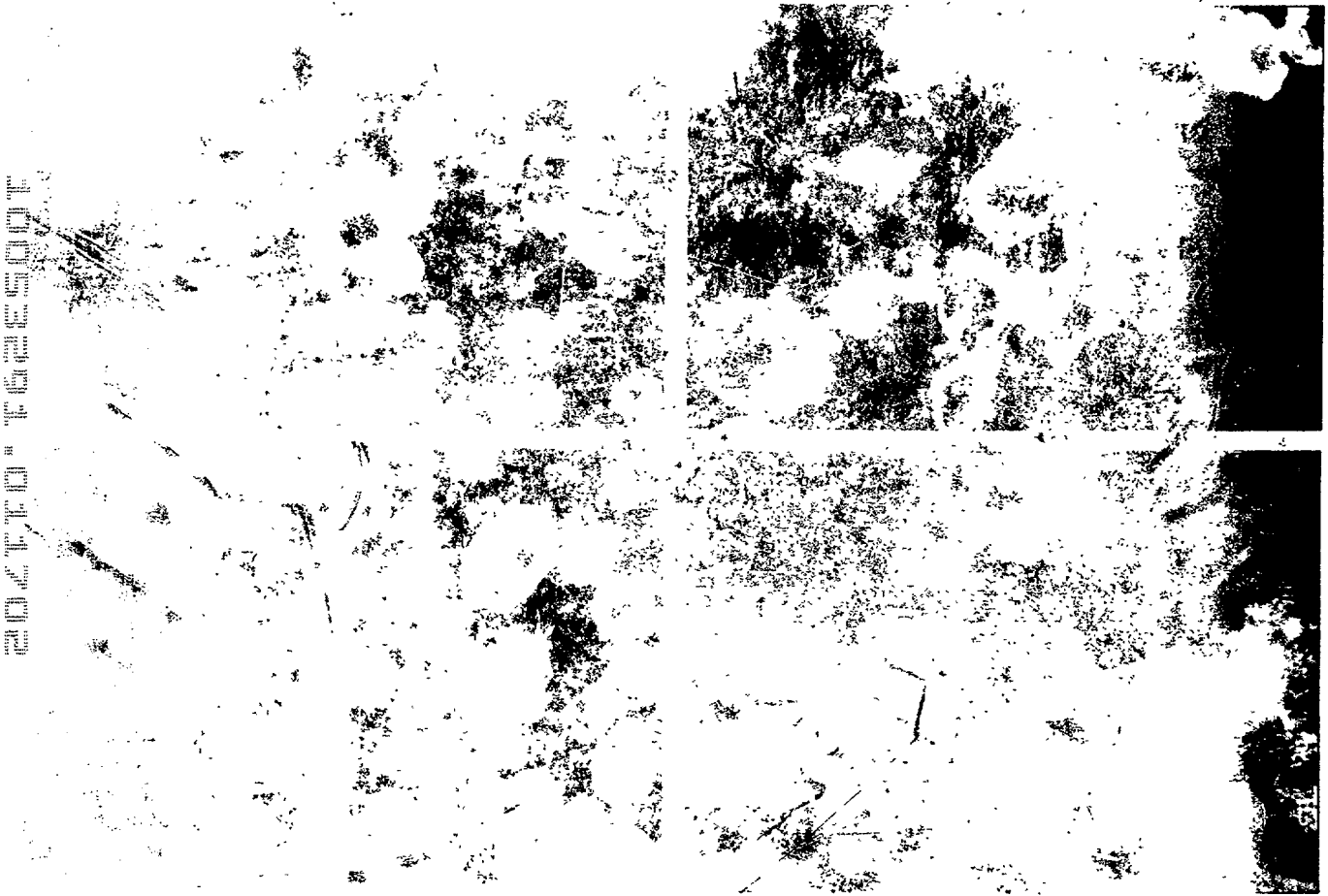
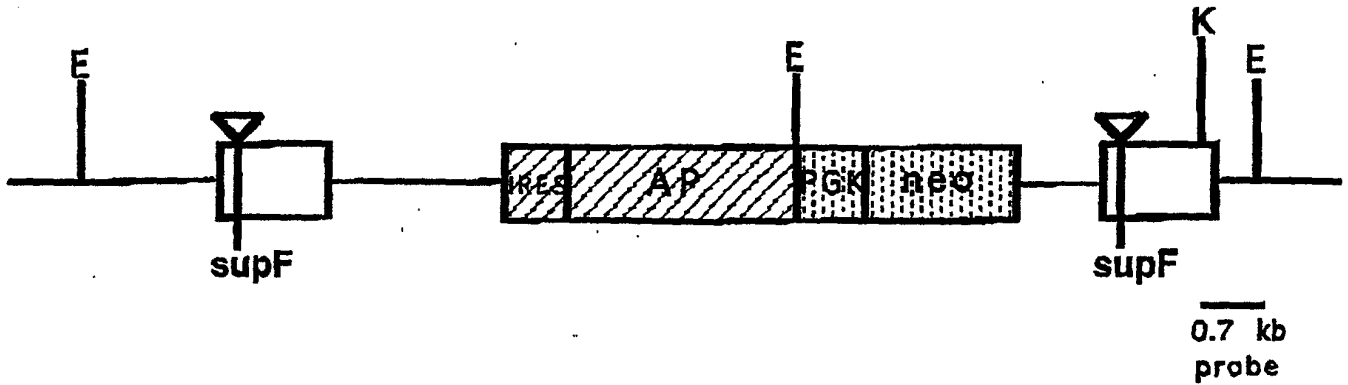


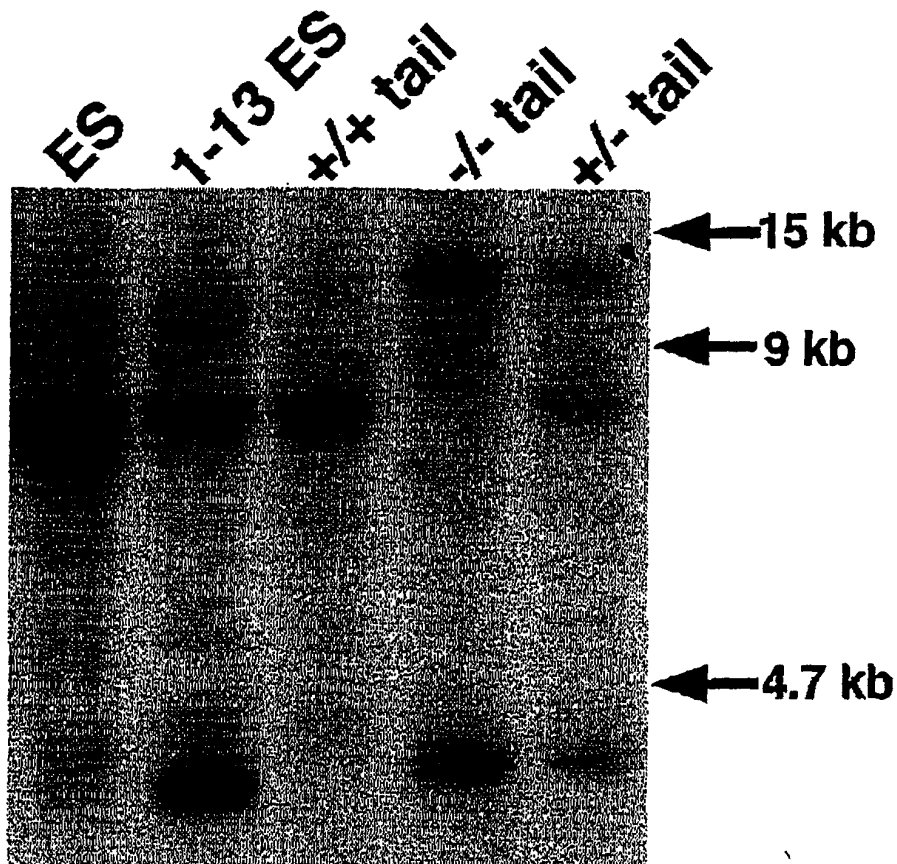
FIGURE 5.

FIGURE 6.

A:



B:







31202 (Sheet 10 of 2)

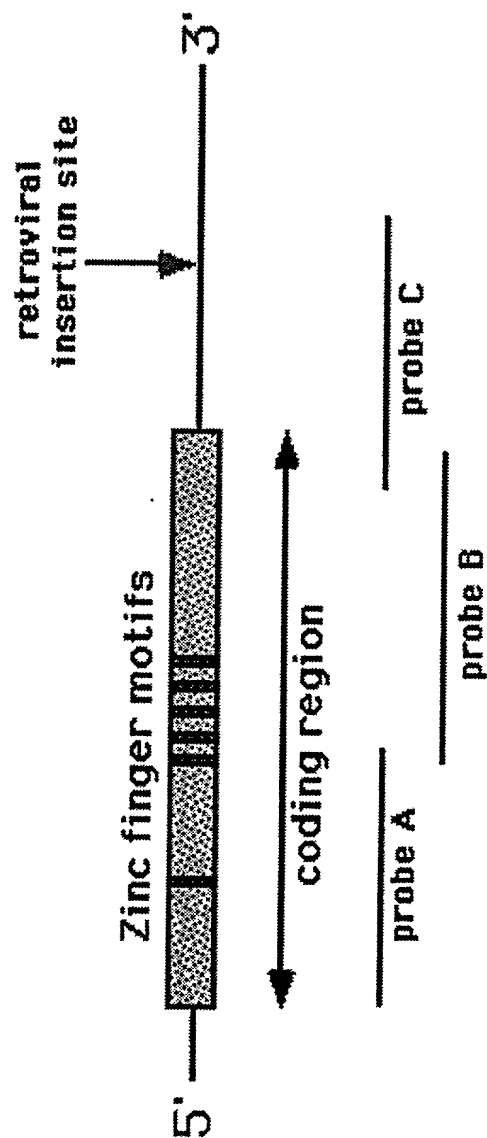


FIGURE 8.

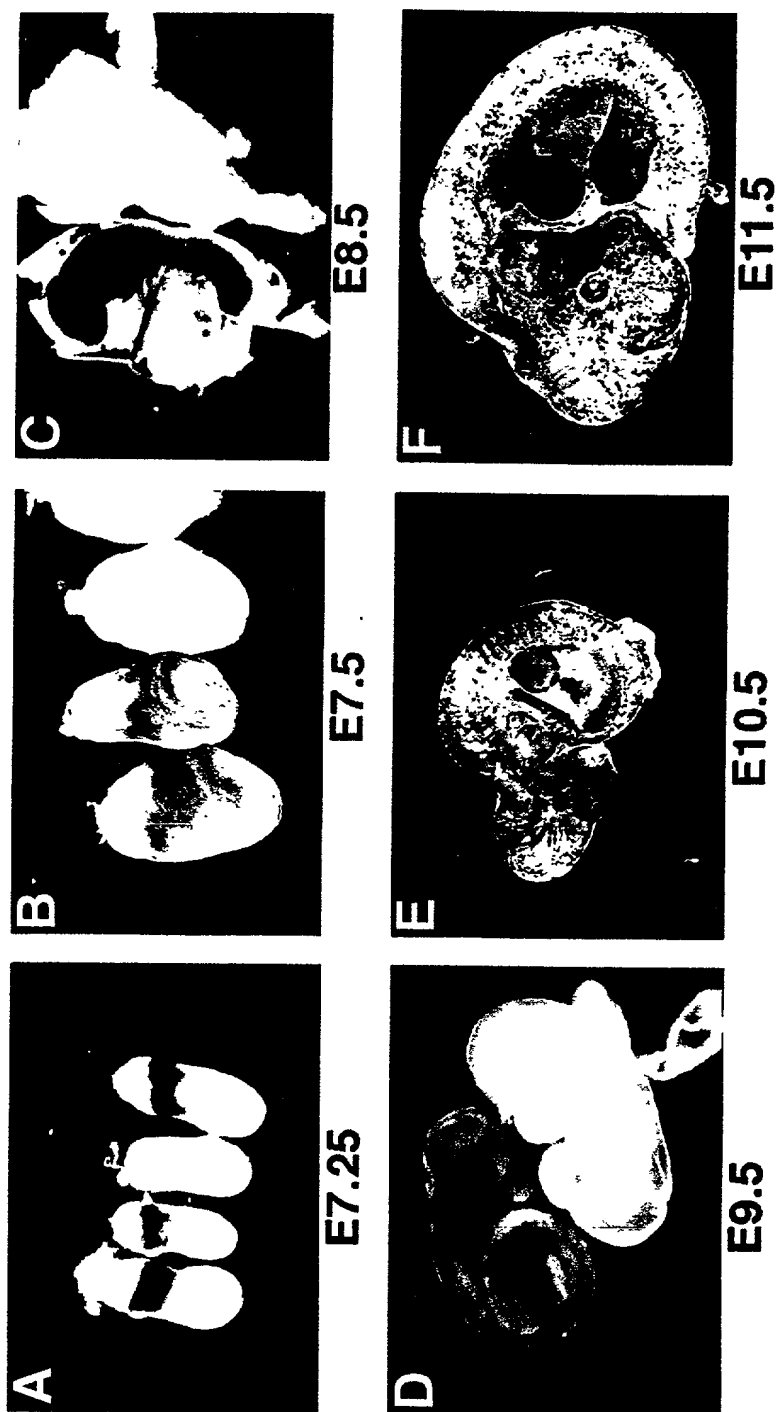


FIGURE 9.

3720 (sheet 12 of 20)

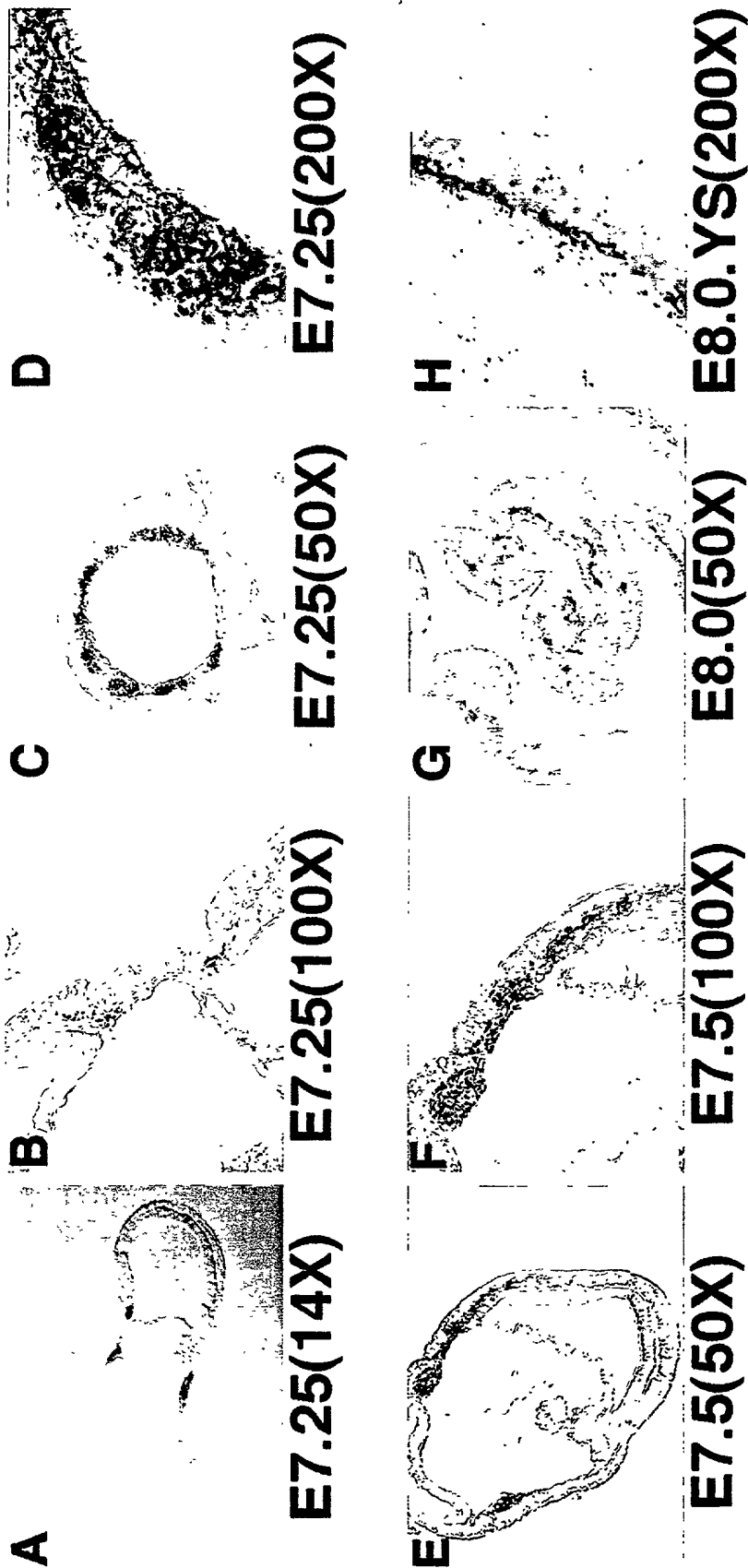


FIGURE 10.

312.0 (sheet 13 of 20)

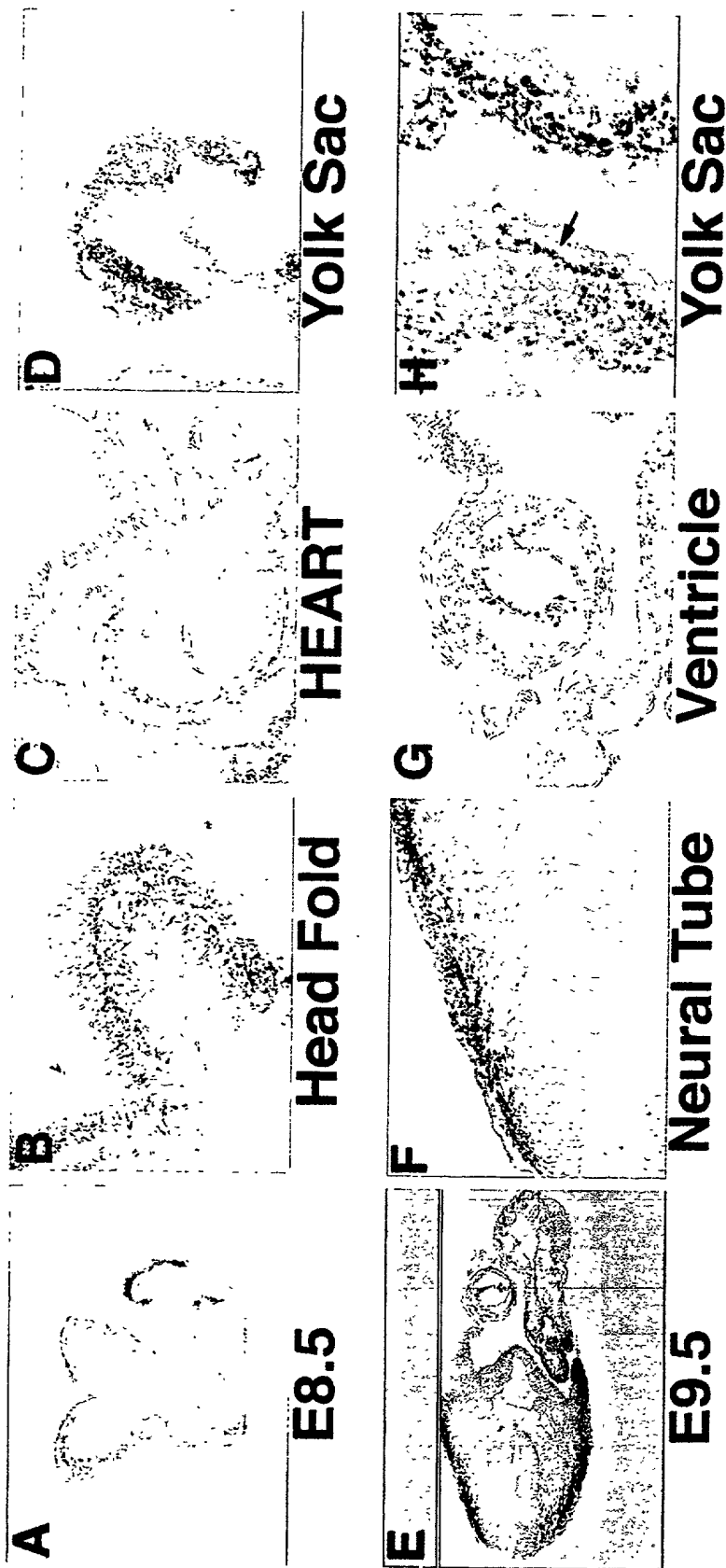


FIGURE 11.

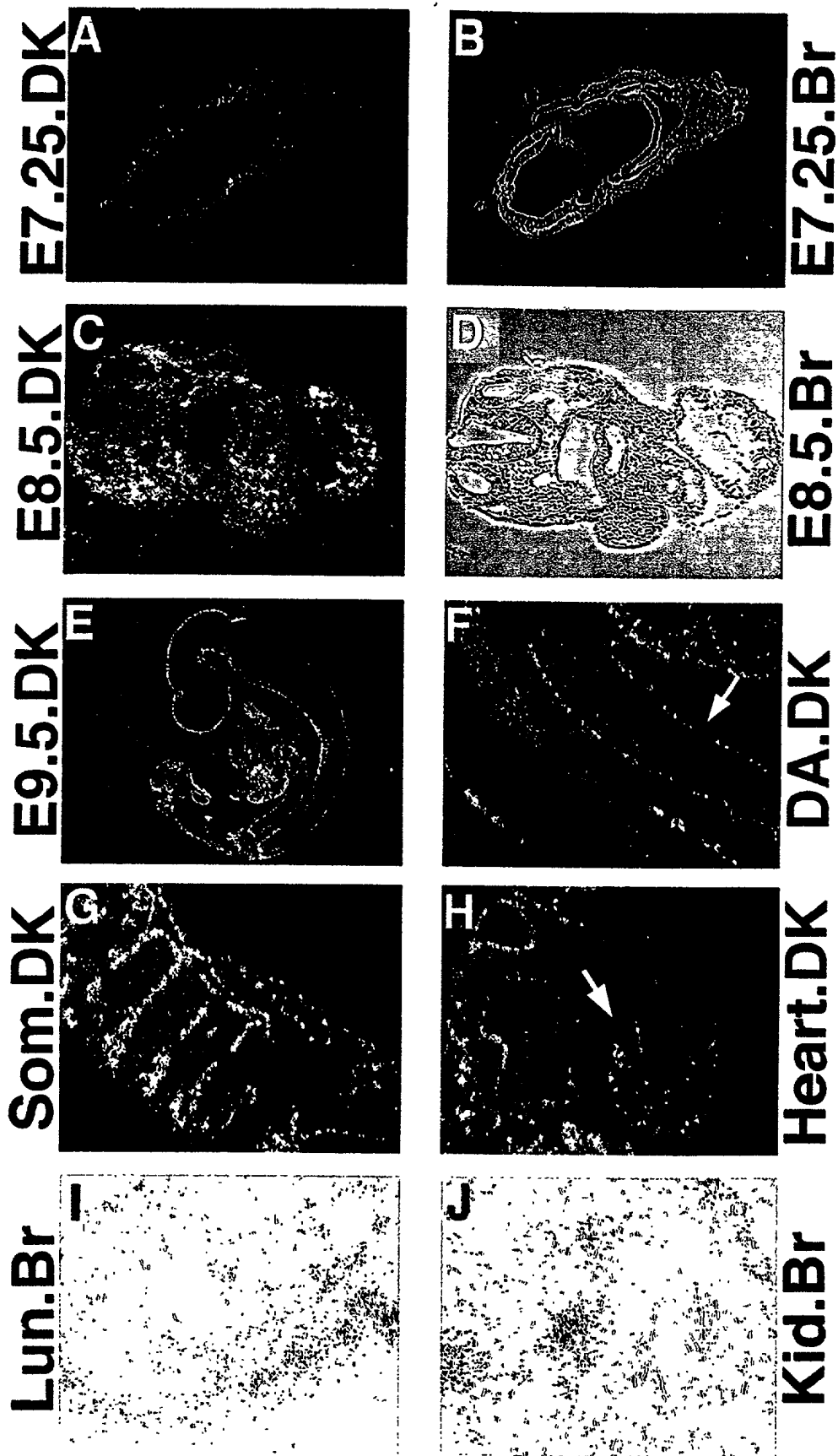
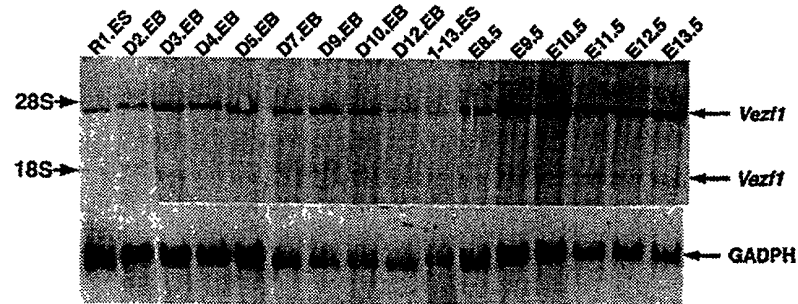


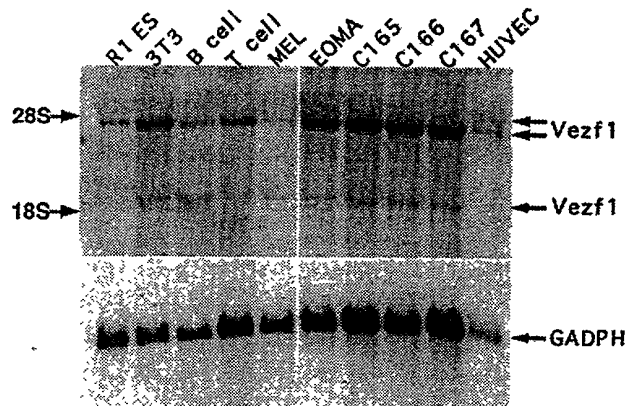
FIGURE 12.

3123 (sheet 15 of 20).

**A.**



**B.**



**C.**

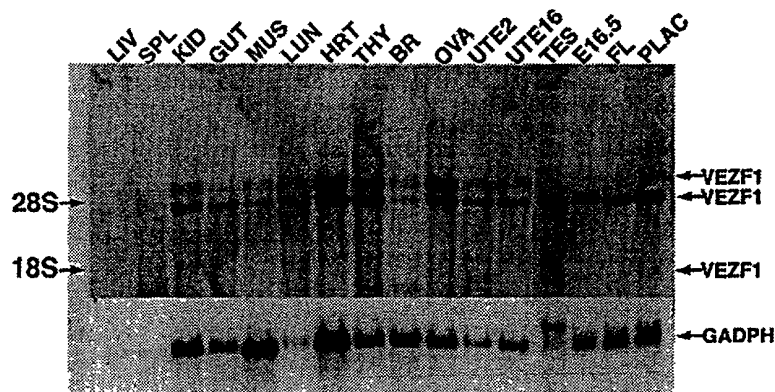


FIGURE 13.

31:30 (Sheet 16 of 20)

1003291.01.02

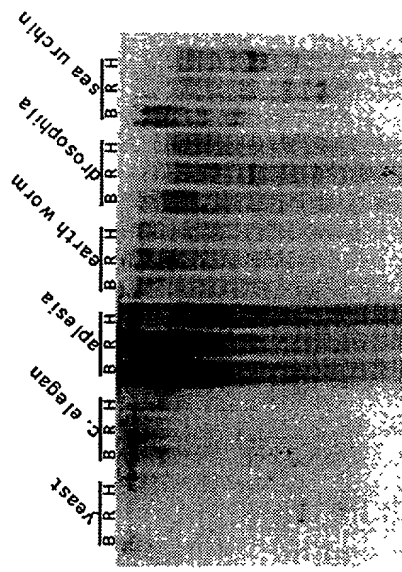
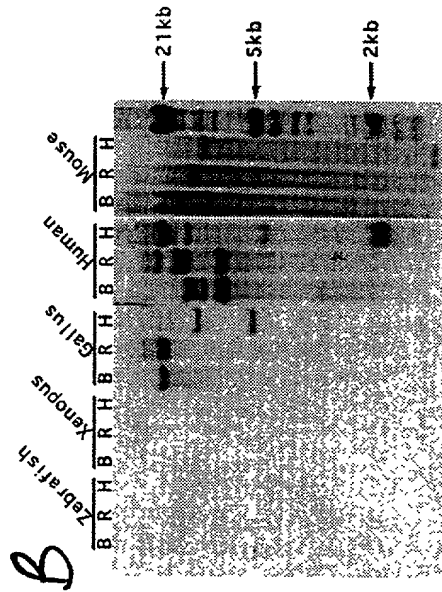


FIGURE 14.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80																				

	Genotype										R	SE
<i>D2Mit6</i>	■	□	■	■	■	■	■	■	■	■	2.13	1.49
<i>Abi1</i>	■	□	■	■	■	■	■	■	■	■	2.13	1.49
<i>Pax8</i>	■	■	■	■	■	■	■	■	■	■	2.13	1.49
<i>Vezf1</i>	■	■	■	■	■	■	■	■	■	■	1.06	1.06
<i>Abl</i>	■	■	■	■	■	■	■	■	■	■	1.06	1.06
<i>Psmb7</i>	■	■	■	■	■	■	■	■	■	■	7.45	2.71
<i>Acvr2a</i>	■	■	■	■	■	■	■	■	■	■		
	45	34	2	2	1	1	1	1	4	3		

A vertical line represents the chromosome segment. At the top is a circle with a vertical dashed line passing through it. Horizontal tick marks of varying lengths indicate gene locations. From top to bottom, the genes are: *D2Mit1*, *D2Bir2*; *D2Mit4*, *D2Mit31*; *Jund2*, *Mpmv3*; *D2Mit178*, *D2Mit464*; *D2Mit6*; *Abi1*; *D2Bir5*, *Pax8*; *Lhx3*, *Notch1*, *Vezf1*; *Abl*, *Eng*, *Pbx3*; *Psmb7*. A vertical scale bar to the right of the chromosome line is labeled "5 cM". At the bottom, the genes *Acvr2a*, *D2Mit155*, *Ctsb-rs*, and *D2Mit8* are listed next to a tick mark. The chromosome line ends with a vertical dashed line at the bottom.

*D2Mit1*, *D2Bir2*

*D2Mit4*, *D2Mit31*

*Jund2*, *Mpmv3*

*D2Mit178*, *D2Mit464*

*D2Mit6*

*Abi1*

*D2Bir5*, *Pax8*

*Lhx3*, *Notch1*, *Vezf1*

*Abl*, *Eng*, *Pbx3*

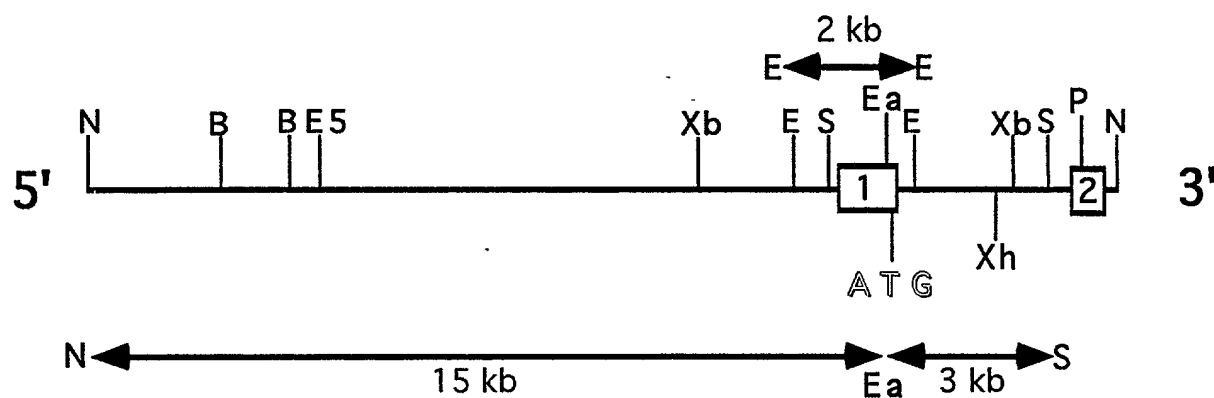
*Psmb7*

5 cM

*Acvr2a*, *D2Mit155*  
*Ctsb-rs*, *D2Mit8*

FIGURE  
15.

# Restriction Enzyme Map of a 20 kb Genomic DNA of the Vezf1 Gene



BamHI (B), EcoRI (E), EcoRV (E5), EagI (Ea), NotI (N), PstI (P), SacI (S), XbaI (Xb), and XhoI (Xh).

— Intronic sequence;

1 Exon 1

2 Exon 2

FIGURE 1G.

# Vezf1 EXPRESSION VECTORS

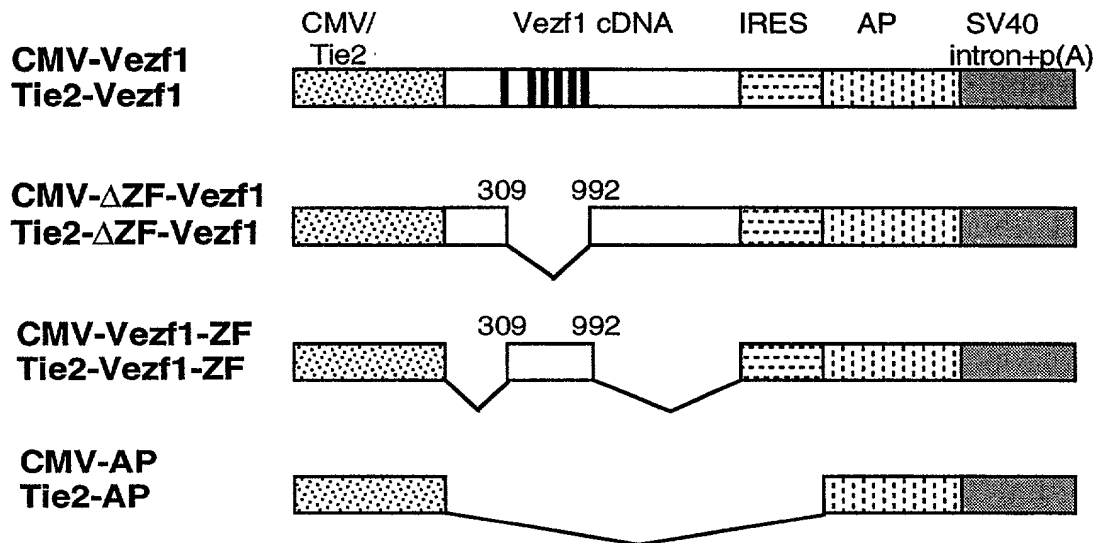


FIGURE 17.

~~PT-AP~~

31270 (sheet 2 of 2)

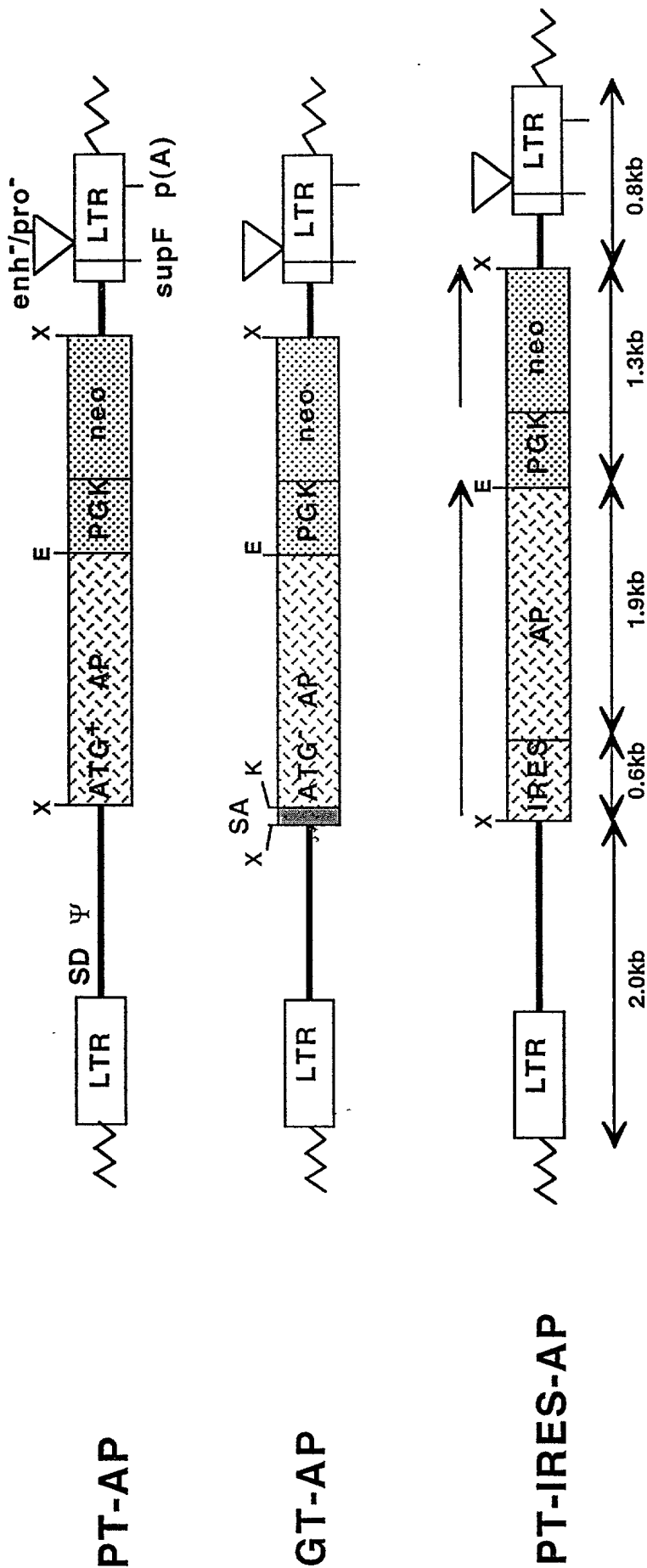


FIGURE 18.